

Supplemental Material

Manuscript Title:

Estimated Reduction in Cancer Risk due to PAH Exposures if Source Control Measures during the 2008 Beijing Olympics were Sustained

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Supplemental Material, Table 1. BaP_{eq} concentration (pg/m³) of the individual PAHs during source control and non-source control periods, t-test results, and percent reduction in concentration (n is the number of samples collected within the corresponding period).

| | Source Control Period (n=41) | | | Non-Source Control Period (n=15) | | | T-test (p_value) | Reduction | |
|----------------------------|------------------------------|--------|---------|----------------------------------|--------|---------|---------------------|-----------|-----|
| | Mean (± sd) | Min. | Max. | Mean (± sd) | Min. | Max. | | Conc. | % |
| Anthracene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Benz[a]anthracene | 74.8 ± 28.1 | 35.2 | 160.1 | 191.3 ± 113.0 | 44.1 | 383.0 | <0.001 | 116.4 | 61% |
| Benzo[b]fluoranthene | 1779.8 ± 846.3 | 784.7 | 3827.9 | 3726.6 ± 2368.1 | 801.7 | 8815.5 | <0.001 | 1946.8 | 52% |
| Benzo[g,h,i]perylene | 11.9 ± 5.6 | 5.3 | 27.2 | 19.6 ± 11.2 | 5.2 | 43.0 | <0.001 | 7.7 | 39% |
| Benzo[k]fluoranthene | 17.1 ± 8.3 | 7.6 | 41.7 | 77.5 ± 94.6 | 7.8 | 293.4 | <0.001 | 60.4 | 78% |
| Chrysene | 26.8 ± 11.9 | 9.5 | 55.7 | 78.1 ± 52.7 | 14.2 | 177.9 | <0.001 | 51.3 | 66% |
| Dibenz[a,h]anthracene | 2103.4 ± 830.0 | 1034.2 | 4390.1 | 3339.6 ± 1806.6 | 964.2 | 7044.3 | <0.001 | 1236.2 | 37% |
| Fluoranthene | 68.4 ± 23.5 | 27.8 | 124.2 | 124.0 ± 63.9 | 23.9 | 234.5 | <0.001 | 55.6 | 45% |
| Indeno[1,2,3-cd]pyrene | 92.6 ± 42.5 | 42.7 | 213.6 | 151.3 ± 87.5 | 41.1 | 334.1 | <0.001 | 58.7 | 39% |
| Phenanthrene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Pyrene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Benzo[a]pyrene | 708.9 ± 367.3 | 297.6 | 1874.7 | 1659.4 ± 1028.7 | 397.9 | 3834.1 | <0.001 | 950.4 | 57% |
| Dibenzo[a,l]pyrene | 915.2 ± 332.1 | 0.0 | 1645.0 | 1458.8 ± 580.9 | 710.2 | 2847.0 | <0.001 | 543.6 | 37% |
| Naphtho[2,3-e]pyrene | 43.4 ± 18.1 | 20.0 | 86.4 | 59.2 ± 29.6 | 18.7 | 118.3 | 0.010 | 15.8 | 27% |
| Dibenzo[a,e]pyrene | 68.6 ± 27.4 | 34.6 | 126.8 | 102.0 ± 51.2 | 30.3 | 209.5 | 0.001 | 33.4 | 33% |
| Dibenzo[a,i]pyrene | 35.4 ± 18.1 | 0.0 | 74.5 | 66.4 ± 35.0 | 15.9 | 146.9 | <0.001 | 31.1 | 47% |
| Dibenzo[a,h]pyrene | 5.3 ± 7.3 | 0.0 | 28.5 | 22.3 ± 17.9 | 0.0 | 58.1 | <0.001 | 16.9 | 76% |
| ΣPPAH _{12-BaPeq} | 4883.6 ± 2124.3 | 2327.4 | 10673.5 | 9367.7 ± 5527.0 | 2301.3 | 21159.7 | <0.001 | 4483.7 | 48% |
| Σ302PAH _{5-BaPeq} | 1068.0 ± 386.5 | 57.1 | 1932.5 | 1708.8 ± 704.2 | 775.1 | 3379.9 | <0.001 | 640.8 | 38% |
| ΣPAH _{17-BaPeq} | 5951.6 ± 2457.4 | 3077.8 | 12595.6 | 11076.1 ± 6191.1 | 3076.4 | 24539.6 | <0.001 | 5124.5 | 46% |

Σ302PAH_{5-BaPeq}: sum of the 5 MW 302 PAHs (DBaeP, DBaiP, DBalP, DBahP, and N23eP);

ΣPPAH₁₂: sum of the 12 priority pollutant PAHs (ANT, BaA, BbF, BghiP, BkF, CHR, DahA, FLA, IcdP, PHE, PYR, and BaP);

ΣPAH₁₇: sum of the 5 MW 302 PAHs and 12 priority pollutant PAHs

Supplemental Material, Table 2. BaP_{eq} concentration (pg/m³) of the individual PAHs during Olympic and non-Olympic periods, t-test results, and percent reduction in concentration (n is the number of samples collected within the corresponding period).

| | Olympic Period (n=16) | | | Non-Olympic Period (n=40) | | | T-test (p_value) | Reduction | |
|----------------------------|-----------------------|--------|--------|---------------------------|--------|---------|---------------------|-----------|-----|
| | Mean (± sd) | Min. | Max. | Mean (± sd) | Min. | Max. | | Conc. | % |
| Anthracene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Benz[a]anthracene | 56.8 ± 11.0 | 35.2 | 74.5 | 125.7 ± 88.2 | 40.7 | 383.0 | 0.002 | 68.9 | 55% |
| Benzo[b]fluoranthene | 1185.9 ± 336.4 | 784.7 | 1994.4 | 2747.4 ± 1748.4 | 801.7 | 8815.5 | <0.001 | 1561.5 | 57% |
| Benzo[g,h,i]perylene | 8.2 ± 2.2 | 5.3 | 13.3 | 16.2 ± 8.6 | 5.2 | 43.0 | <0.001 | 8.0 | 49% |
| Benzo[k]fluoranthene | 11.6 ± 3.6 | 7.6 | 20.2 | 41.9 ± 63.5 | 7.8 | 293.4 | 0.031 | 30.3 | 72% |
| Chrysene | 18.4 ± 4.5 | 9.5 | 28.0 | 49.4 ± 40.0 | 13.4 | 177.9 | 0.002 | 31.0 | 63% |
| Dibenz[a,h]anthracene | 1570.4 ± 405.3 | 1034.2 | 2540.7 | 2780.2 ± 1347.8 | 964.2 | 7044.3 | <0.001 | 1209.8 | 44% |
| Fluoranthene | 53.3 ± 13.9 | 27.8 | 80.8 | 95.3 ± 48.1 | 23.9 | 234.5 | <0.001 | 42.0 | 44% |
| Indeno[1,2,3-cd]pyrene | 65.2 ± 16.8 | 42.7 | 102.9 | 125.6 ± 66.3 | 41.1 | 334.1 | <0.001 | 60.4 | 48% |
| Phenanthrene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Pyrene | 0.0 ± 0.0 | 0.0 | 0.0 | 0.0 ± 0.0 | 0.0 | 0.0 | - | - | - |
| Benzo[a]pyrene | 459.6 ± 133.8 | 297.6 | 742.1 | 1165.1 ± 787.3 | 374.1 | 3834.1 | <0.001 | 705.5 | 61% |
| Dibenzo[a,l]pyrene | 794.4 ± 242.3 | 259.5 | 1176.7 | 1167.4 ± 504.1 | 0.0 | 2847.0 | 0.003 | 373.0 | 32% |
| Naphtho[2,3-e]pyrene | 31.0 ± 8.1 | 20.0 | 47.7 | 54.4 ± 23.2 | 18.7 | 118.3 | <0.001 | 23.4 | 43% |
| Dibenzo[a,e]pyrene | 49.5 ± 11.5 | 34.6 | 71.8 | 88.8 ± 39.0 | 30.3 | 209.5 | <0.001 | 39.2 | 44% |
| Dibenzo[a,i]pyrene | 26.6 ± 10.3 | 9.5 | 44.1 | 50.5 ± 29.0 | 0.0 | 146.9 | 0.001 | 23.8 | 47% |
| Dibenzo[a,h]pyrene | 4.0 ± 5.2 | 0.0 | 14.5 | 12.2 ± 14.9 | 0.0 | 58.1 | 0.019 | 8.2 | 67% |
| ΣPPAH _{12-BaPeq} | 3429.3 ± 872.2 | 2327.4 | 5539.0 | 7146.8 ± 4112.5 | 2301.3 | 21159.7 | <0.001 | 3717.4 | 52% |
| Σ302PAH _{5-BaPeq} | 905.6 ± 256.1 | 372.7 | 1257.6 | 1373.2 ± 598.0 | 57.1 | 3379.9 | 0.002 | 467.6 | 34% |
| ΣPAH _{17-BaPeq} | 4334.9 ± 1019.8 | 3077.8 | 6570.3 | 8520.0 ± 4670.7 | 3076.4 | 24539.6 | <0.001 | 4185.0 | 49% |

Σ302PAH_{5-BaPeq}: sum of the 5 MW 302 PAHs (DBaeP, DBaiP, DBalP, DBahP, and N23eP);

ΣPPAH₁₂: sum of the 12 priority pollutant PAHs (ANT, BaA, BbF, BghiP, BkF, CHR, DahA, FLA, IcdP, PHE, PYR, and BaP);

ΣPAH₁₇: sum of the 5 MW 302 PAHs and 12 priority pollutant PAHs

Supplemental Material, Figure 1. Comparison of the measured concentration and benzo[a]pyrene (BaP) equivalent concentrations for 12 priority PAHs (PPAH₁₂ and PPAH_{12-BaPeq}) and 5 MW 302 PAHs (302PAH₅ and 302PAH_{5-BaPeq})

